

CLAIMS

1 1. A digital camera system having a digital camera and a computer for transferring
2 pictures of images taken by the digital camera therebetween comprising:

3 a card removably and directly coupled, without any intermediary device, between the
4 digital camera and the computer for temporarily storing the images by the digital camera and
5 for transferring the temporarily stored images to the computer for viewing, editing and
6 reproduction thereof.

1 2. A digital camera system as recited in claim 1 wherein the card is removably coupled to
2 the computer for transferring the images in a serial fashion to the computer.

1 3. A digital camera system as recited in claim 2 wherein the card is removably coupled to
2 the computer for transferring the images using a Universal Serial Bus (USB) interface.

1 4. A digital camera system as recited in claim 3 wherein the card is removably coupled to
2 the digital camera for transferring the images, in digital and parallel fashion.

1 5. A digital camera system as recited in claim 4 wherein the card is removably coupled to
2 the digital camera for transferring the digital parallel images using a PCMCIA/CF interface.

1 6. A digital camera system as recited in claim 5 wherein the card includes an interface
2 module for receiving the digital parallel images through the PCMCIA/CF interface and
3 converting the same to the serial digital images for transfer thereof to the computer.

1 7. A digital camera system as recited in claim 6 wherein the transfer of the serial digital
2 images is performed pursuant to the Universal Serial Bus (USB) standard.

1 8. A digital camera system as recited in claim 7 wherein the card further includes flash
2 memory coupled to the PCMCIA/CF interface and the interface module for temporarily
3 storing the digital images.

1 9. A digital camera system as recited in claim 8 wherein the card further includes a
2 common logic block for transferring the digital images between the flash memory and the
3 PCMCIA/CF interface and for further transferring the digital images between the interface
4 module and the flash memory.

1 10. A digital camera system as recited in claim 9 wherein the common logic block is
2 shared between the PCMCIA/CF interface and the interface module thereby avoiding
3 duplication of the common logic block.

1 11. A digital camera system as recited in claim 10 wherein the common logic block
2 includes a microcontroller block for processing information received from the computer,
3 through the interface module, and the digital camera, through the PCMCIA/CF interface, the
4 common logic block further including a data buffer for temporarily storing digital images
5 retrieved from the flash memory, a task file for storing commands received from the digital
6 camera and the computer, and a CIS RAM/ROM for storing identification information.

1 12. A digital camera system as recited in claim 11 wherein the interface module includes
2 an application interface for initiating communication between the computer and the
3 microcontroller.

1 13. A digital camera system as recited in claim 12 wherein the USB standard is defined to
2 include a first mode of application specifying a first data transfer mode and a second mode of
3 application specifying a second data transfer mode, the interface module including a USB
4 engine coupled to computer and the application interface wherein the USB engine operates to

5 accommodate said first and second modes of application without the need for any
6 modifications to the card.

1 14. A digital camera system as recited in claim 13 wherein the first mode of application is
2 ATA and the second mode of application is bulk-only mass storage class.

1 15. A digital camera system as recited in claim 14 wherein the interface module further
2 includes a transceiver coupled between the computer and the USB engine for converting
3 digital images to analog images for transfer to the computer and for further converting analog
4 images to digital images for transfer to the digital camera, the interface module further
5 includes a serial interface engine for converting digital images in serial fashion to digital
6 images in parallel fashion and for further converting digital images in parallel fashion to
7 digital images in serial fashion.

1 16. A digital camera system as recited in claim 1 wherein the computer includes a screen
2 viewable by a user of the computer wherein an icon is shown thereupon when the card is
3 coupled to the computer and the icon is not shown on the screen when the card is removed
4 from the computer.

1 17. A card for use in a digital camera system, the digital camera system having a digital
2 camera and a computer for transferring pictures of images taken by the digital camera between
3 the digital camera and the computer comprising:

4 a controller for controlling the transfer of images between the digital camera and the
5 computer by transferring images, in digital format, to the digital camera through a first
6 interface and for transferring the images to the computer through a second interface; and

7 flash memory for temporarily storing the images, wherein the card is removably and
8 directly coupled, without any intermediary device, between the digital camera and the
9 computer for temporarily storing the images and for transferring the temporarily stored images
10 to the computer for viewing, editing and reproduction thereof.

1 18. A card for use in a digital camera system as recited in claim 17 wherein the first
2 interface is a PCMCIA/CF interface and the second interface is a USB interface.

1 19. A card for use in a digital camera system as recited in claim 18 wherein the controller
2 includes a first interface module for causing communication between the card and the digital
3 computer through the PCMCIA/CF interface, a second module for causing communication
4 between the card and the computer through the USB interface and a third module coupled to
5 the first and second modules for causing images to be transferred to the flash memory.

1 20. A card for use in a digital camera system as recited in claim 19 wherein the computer
2 includes a screen viewable by a user of the computer, the card for causing an icon to be shown
3 on the screen when the card is coupled to the computer and for further causing the icon not to
4 be shown on the screen when the card is removed from the computer.

1 21. A card for use in a digital camera system as recited in claim 19 wherein the card
2 further includes a common logic block for transferring the digital images between the flash
3 memory and the first module and for further transferring the digital images between the
4 second module and the flash memory, wherein the common logic block is shared between the
5 first module and the second module thereby avoiding duplication of the common logic block.

1 22. A card for use in a digital camera system as recited in claim 21 wherein the common
2 logic block includes a microcontroller block for processing information received from the
3 computer, through the second module, and information received from the digital camera,
4 through the PCMCIA/CF interface, the common logic block further including a data buffer for
5 temporarily storing digital images retrieved from the flash memory, a task file for storing
6 commands received from the digital camera and the computer, and a CIS RAM/ROM for
7 storing identification information.

1 23. A card for use in a digital camera system as recited in claim 22 wherein the USB
2 standard is defined to include a first mode of application specifying a first data transfer mode
3 and a second mode of application specifying a second data transfer mode, the interface
4 module including a USB engine coupled to computer and the application interface wherein the
5 USB engine operates to accommodate said first and second modes of application without the
6 need for any modifications to the card.

1 24. A card for use in a digital camera system as recited in claim 23 wherein the first mode
2 of application is ATA and the second mode of application is bulk-only mass storage class.

1 25. A card for use in a digital camera system as recited in claim 24 wherein the second
2 module further includes a transceiver coupled between the computer and the USB engine for
3 converting digital images to analog images for transfer thereof to the computer and for further
4 converting analog images to digital images for transfer thereof to the digital camera, the
5 second module yet further includes a serial interface engine for converting digital images in
6 serial fashion to digital images in parallel fashion and for further converting digital images in
7 parallel fashion to digital images in serial fashion.

1 26. A method of transferring pictures of images taken by the digital camera between a
2 digital camera and a computer comprising:

3 providing images in digital format to the digital camera through a first interface;
4 temporarily storing the digital images in flash memory; and
5 transferring the stored images to the computer through a second interface directly and
6 without any intermediary device, between the digital camera and the computer.